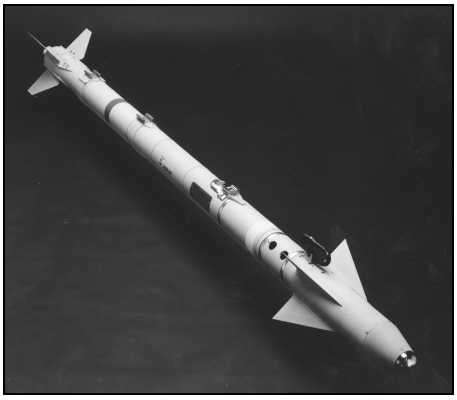
AIM-9X SIDEWINDER AIR-TO-AIR MISSILE



The AIM-9X Sidewinder Air-to-Air missile program is a follow-on modification to the existing AIM-9M short-range missile, for both USAF and Navy/Marine Corps fighter aircraft. AIM-9X is a highly maneuverable, launch and leave missile that uses passive infrared guidance to engage multiple types of targets. It will provide day/night capability with improved countermeasures resistance and High Off-Boresight (HOB) improvements relative to the AIM-9M. AIM-9X is designed to work with any on-board aircraft cueing source, including the Joint Helmet-Mounted Cueing System, which is being developed in a parallel program to enhance HOB capability.

The AIM-9X missile retains the warhead, fuze, and rocket motor of the established Sidewinder missile family. A new imaging infrared focal plane array seeker, thrust-vectored tail-control actuation system, and state-of-the-art signal processor/auto pilot provide the missile with significant performance improvements. The F-15C/D and F/A-18C/D will be the initial platforms for AIM-9X integration and testing. The missile will eventually be integrated with the F-16, F/A-18E/F, F-15E, and F-22.

BACKGROUND INFORMATION

AIM-9X is a joint Navy/Air Force program, with the Navy the Executive Service. Development was initiated in response to foreign missiles that clearly exceed AIM-9M capabilities. DEM/VAL began in 1994. AIM-9X is an Acquisition Reform program in which the contractor bears total system performance responsibility for a system that meets performance specifications derived from the Operational Requirements Document (ORD). The contractor is developing AIM-9X through an Integrated Product Team (IPT) management approach including Service and OSD membership. EMD began in January 1997, and is planned for completion in approximately six years. A full-rate production decision is scheduled for 3QFY03.

Modeling and simulation (M&S) is key to the development and evaluation of AIM-9X. Due to this missile's expanded capabilities and the high cost of test launches, a family of simulations will be used to assess missile performance across a wide spectrum of engagements encompassing various threats, backgrounds, and countermeasures. Live missiles are being used to validate these simulations. Since the same simulations will be used for OT and DT, DOT&E and the OTAs have been involved in the intensive M&S planning, from an independent Draper Lab assessment of the M&S strategy, through the decision to contract with the Joint Accreditation Support Activity to assist in simulation validation, verification, and accreditation (VV&A) efforts. DT VV&A plans from the Program Office were

developed with DOT&E participation and approval. Joint DT/OT technical review and accreditation panels continue to review M&S activities to support accreditation for LRIP, OT readiness, and Milestone III decisions.

The LFT&E program began with three warhead characterization (static) tests (same warhead as AIM-9M), to determine the affect of the added wiring harness and cover on warhead performance. Testing was conducted March-April 2000. LFT&E expanded when a primary threat target became available. In 1999, static testing of the warhead against this target demonstrated the lethality of the warhead for several expected endgame geometries. Results supported model improvements and will support validation of the Joint Service Endgame Model, which will be used in determination of AIM-9X Probability of Kill (Pk).

TEST & EVALUATION ACTIVITY

AIM-9X test and evaluation activity has continued with additional captive carry development and demonstration tasks, and missile test launches from F-15s and F/A-18C/Ds. Six Separation and Control Test Vehicle (SCTV) launches were conducted to demonstrate missile aerodynamic performance in stressing scenarios. All launches were successful.

DT Phase IIB/C culminated with four successful Production Representative Model (PRM) missile shots against QF-4 drone target aircraft. The warheads of these PRMs were replaced with telemetry packages. DT IIB/C was followed by the DT-IID Technical Evaluation phase. This phase continued PRM tests to mature missile software, continue validation of simulation models, and prepare for OPEVAL in February 2002. All five PRMs in this phase successfully intercepted targets that were either maneuvering or dispensing infrared countermeasures in an adverse background.

TEST & EVALUATION ASSESSMENT

The program has invested heavily in M&S to support development and testing, including simulation of potential threats, backgrounds, and countermeasures. Development of the simulation suite is progressing and validation continues to be done with both SCTV missile firings and PRM guided missile firings. The PRM configuration continues maturation of tracker software as planned to meet ORD Pk thresholds against the threat target employing countermeasures in clutter backgrounds. M&S will be used to assess ORD Pk against the threat targets. Simulation initiatives have allowed the number of guided test missiles to be significantly reduced. The AIM-9X program is conducting up to 22 developmental test and 22 OT&E guided missile launches, compared to AMRAAM's 103 development and 69 OT&E guided launches. Accordingly, if test results with these few missiles do not meet operational requirements or do not agree with simulation results, additional test missile firings will be required.

The AIM-9X program is strong. It demonstrates the benefits of a cooperative IPT approach by involving the prime contractor, program management, Air Force and Navy test organizations, and OSD in developing a practical and credible simulation strategy supporting missile development and OT&E.